

REMARKS

Reconsideration of the application is requested.

Claims 11-12, 14-15 and 24-31 remain in the application.

Claims 11-12, 14-15, and 24-31 are subject to examination.

Claims 11, 24, and 27 have been amended.

In item 2 on pages 2 and 3 of the above-identified Office Action, claims 11-12, 14-15, and 24-31 have been rejected as being obvious over U.S. Patent No. 5,169,680 to Ting et al.

(hereinafter Ting) or International Patent Disclosure WO 99/34424 to Subrahmanyam et al. (hereinafter Subrahmanyam) under 35 U.S.C. § 103.

The rejection has been noted and the claims have been amended in an effort to even more clearly define the invention of the instant application. Support for the changes to the claims is found on page 7, lines 16-18, page 8, lines 9, 10 and claims 11, 24 and 27 of the specification of the instant application.

In Ting, a window 45 is formed in the dielectric layers 41, 42 resulting in the exposure of an electrically conductive layer 36. The electrically conductive layer 36 is then catalytically activated (see layers 50, 51).

In contrast, to claims 11, 24, and 27 of the instant application, Ting fails to disclose selectively activating an electrically insulating layer wherein the activated region is a selectively modified region or a surface of the activated insulating region.

The activation, as taught in Ting, is always carried out on the electrically conductive layer 36 or on the semiconductor layer 10. Ting thus fails to disclose that the activation itself is selectively performed on an electrical insulating layer. As can be seen in Figs. 2 and 5 of Ting, the insulating layers 11, 41, 42 are prevented from being activated. Admittedly, Fig. 5 as drawn out of scale, shows that the catalytically activating material 50, 51 has a small contact region with the lower insulating region 42. However, in reality these layers 50, 51 are extremely thin and the person skilled in the art knows that this edge region has no technical meaning and is shown out of scale for comprehension purposes.

The Examiner notes column 3, lines 9-16 of Ting which discloses in a very general manner the step of "selectively depositing a conductive material on the underlying layer which may be a conductor or a nonconductor". The underlying

layer in this context refers to the activator material itself which may be a conductor or a nonconductor. However, Ting fails to disclose that a layer below the activator, i.e. a layer to be activated by the activator, can be electrically insulating. In other words, the cited parts does not relate to the conducting properties of the layer to be activated, but only relates to properties of the activation material itself. Concerning the layer to be activated, Ting as a whole is restricted to conductive materials (i.e. Al for layer 36 or silicon, GaAs, or other III-V semiconductors for the substrate 10), not to electrically insulating materials.

Furthermore, no selective activation of a dielectric layer is disclosed in column 3, lines 9-16 of Ting. In contrast to this, only a selective deposition of a conductive filling material on the activated region itself is disclosed (see column 6, lines 20-22).

Now turning to Subrahmanyam, Subrahmanyam teaches depositing a barrier/liner layer on an exposed dielectric surface prior to the deposition of a metal. However, the barrier/liner layer is known in the art as a diffusion barrier layer and not as an activator. No subsequent process is activated by the diffusion layer. A diffusion layer prevents certain subsequent processes such as diffusion. In contrast, an

activator enables certain subsequent processes (i.e. metallization). Thus the teachings of Subrahmanyam does not include activating an electrically insulating layer and in particular does not disclose selectively activating an activated region of an electrically insulating layer. The activated region is a selectively modified region or surface of the activated insulating layer. Subrahmanyam neither selectively activates an electrically insulating layer nor modifies an electrically insulating layer, but merely deposits a liner layer on a lower layer.

Furthermore, amended claims 11, 24 and 27 of the instant application recite selectively activating an insulating layer having a thickness of 0.05  $\mu\text{m}$  to 50  $\mu\text{m}$  to generate an activated region using a gas, a liquid, a solution or plasma as the activator. The activated region being a selectively modified region or a surface of the activated insulation layer so that subsequently only the activated region can be subject to metallization, photosensitization and hydrophobicization. These specific features are not believed to be taught in Ting or Subrahmanyam.

A basis concept of the invention is to selectively activate the electrically insulating layer so that subsequently a metallization, a photosensitization or a hydrophobicization

can be carried out on a predetermine selectively activated region of a dielectric layer. Therefore, the invention allows for a metallization, photosensitization or hydrophobicization only and selectively on defined parts of the electrically insulation layer without the need to take into account electrical conduction of the layer below. The electrical conductivity of such a layer according to the prior art may be restriction for certain electrical applications.

Moreover, the person skilled in the art does not get any hint, suggestion or motivation from the cited prior art to selectively activate an electrically insulating layer. With this measure, it becomes possible that only exposed regions of the electrically insulating material are subject of an activation that allows to define activated regions only on desired parts of the electrical insulating layer. As a consequence of the selective activation, other surfaces of the component are prevented from being undesirably activated.

It is accordingly believed to be clear that none of the references, whether taken alone or in any combination, either show or suggest the modes and/or features of claims 11, 24 and 27. Claims 11, 24 and 27 are, therefore, believed to be patentable over the art. The dependent claims are believed

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to be patentable as well because they all are ultimately  
dependent on claim 11, 24 or 27.

In view of the foregoing, reconsideration and allowance of  
claims 11-12, 14-15 and 24-31 are solicited.

Petition for extension is herewith made. The extension fee  
for response within a period of two months pursuant to  
Section 1.136(a) in the amount of \$420.00 in accordance with  
Section 1.17 is enclosed herewith.

Please charge any other fees that might be due with respect  
to Sections 1.16 and 1.17 to the Deposit Account of Lerner  
and Greenberg, P.A., No. 12-1099.

Respectfully submitted,

  
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For Applicants

REL:cgm

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